

REMARKS

The §112 Rejections

The Examiner had rejected several of the claims under 35 U.S.C. §112 due to use of the term “permitting” as a step in the claims. Each of the independent claims in question has been amended to delete that language, and accordingly it is believed that the rejection under §112 should be withdrawn.

The Amendment to the Specification

The Examiner had objected to the disclosure because of an embedded hyperlink. Applicant has amended the disclosure at the bottom of page 2 to delete the embedded hyperlink.

The Substantive Rejections - The Independent Claims

Abraham Is Not Capable Of Dealing With Parts “Of Arbitrary Shape”

Regardless Of Whether They Are Two-Dimensional Or Three-Dimensional

The primary reference relied upon by the Examiner for all the rejections continues to be Abraham et al. U.S. Patent No. 5,570,292.

Applicant has described in detail in the previous response all of the shortcomings of the Abraham reference as compared to each of the independent claims. Those comments will not be repeated here, but they are incorporated by reference.

In response to Applicant’s previous arguments, the Examiner has modified her grounds of rejection of each of the claims to include as a secondary reference

“Applicant’s Admitted Prior Art (hereinafter referred to as AAPA)” which the Examiner has described as follows: “However, AAPA discloses that these additive manufacturing techniques involve the use of computer controlled manufacturing processes which can manufacture a three dimensional part from a CAD file describing the part (page 2, lines 12-14); and the designer can use a pre-existing CAD file or may wish to create one expressly for prototyping purposes (page 5, lines 5-7)”.

In response to the amendments and arguments previously submitted by Applicant the Examiner has taken the position that those are not persuasive and has stated her response as follows:

“In response to applicant’s arguments, regarding claims 1, 31, 52, and 70-73, that Abraham does not deal with provide or allow (i) three-dimensional parts; (ii) loading a pre-existing file; and (iii) analyzing a custom manufactured part of arbitrary shape, it is noted that AAPA was applied for limitations (i) and (ii). As per limitation (iii), Abraham et al. disclose that *“the rule-based parametric design feature, not only allows extension of the design to multiple panels, but to panels of irregular or varied shapes, such as to trapezoidal, triangular, peak pentagon, arch shapes, and to other geometrical shapes”* (see col. 10, lines 7-16).”

With respect, even if one accepts the Examiner’s contention that the AAPA in combination with Abraham would make it obvious to modify Abraham to receive three-dimensional CAD files, (which Applicants certainly do not accept for the reasons further set forth below) the Abraham system still would not be capable of dealing with such a CAD file for a custom manufactured part of arbitrary shape.

The underlined phrase “of arbitrary shape” means that the part defined by the CAD file can have a shape of the client’s origination, and it is not limited to predetermined shapes dictated by the manufacturer.

The Abraham system, on the other hand, cannot handle files related to arbitrary shapes, but can only handle files selected from a menu provided by the manufacturer.

To this point, the Examiner has referred to Abraham at column 10, lines 7-16 and has quoted the language “the rule-based parametric design feature, not only allows extension of the design to multiple panels, but to panels of irregular or varied shapes, such as to trapezoidal, triangular, peak pentagon, arch shapes, and to other geometrical shapes”.

The Examiner is apparently equating Abraham’s “irregular or varied shapes” to the “arbitrary shape” required by the present claims. But, there is nothing arbitrary about the “irregular or varied” shapes of Abraham. Those “irregular or varied shapes” still must be selected from the very limited menu provided by the manufacturer. The language the Examiner has quoted from Abraham is simply an extension of the previous paragraph at column 9, line 52 through column 10, line 6 where Abraham describes the ability of its system to resize a rectangular shaped panel. The subsequent paragraph which the Examiner has quoted is merely saying that those pre-existing designs can also be reshaped by the manufacturer’s program to other predetermined shapes other than rectangular, which Abraham has referred to generally as “irregular or varied shapes” and for which Abraham has given the specific examples of “trapezoidal, triangular, peak pentagon, arch shapes, and to

other geometrical shapes". Even though those specific shapes are more complex than a rectangular shape, they still are in no sense arbitrary.

The present claims require the system to be capable of dealing with a CAD file describing a custom manufactured part of arbitrary shape. That means the shape is determined by the customer, not by the manufacturer.

The Abraham et al. system is not at all related to the manufacture of truly custom parts of arbitrary shape, regardless of whether they are two dimensional or three dimensional. Instead, the Abraham et al. system merely describes a proprietary network entirely controlled by the product manufacturer which allows the customer to select and order from a menu, with some modest customization as to size or to shape selected from those shapes predetermined by the manufacturer. The customer selects from one of a limited number of manufacturer specified product shapes. Then the customer is allowed to make some limited modifications to that shape simply to make it fit a window opening in which the customer is going to place the manufacturer's specified design.

Thus it is apparent that from the commercial viewpoint the Abraham et al. system is directed to a completely different problem than is the present invention. The present invention provides a system which allows the customer to get a binding price quotation for a three-dimensional custom manufactured part of arbitrary shape completely determined by the customer. Abraham et al. on the other hand is simply an ordering system completely controlled by the manufacturer which simply provides pricing on customer selected options from a manufacturer specified design and option list. No amount of modification of the Abraham et al. system is ever

going to turn it into the system of the present invention. They simply are directed to entirely different problems and processes.

With regard to the Examiner's proposed use of AAPA to allegedly make obvious the use of three-dimensional CAD files with the Abraham reference, it is respectfully submitted that such a combination would not be obvious. As a reading of the Abraham et al. disclosure shows it is directed solely to the manufacture of glass panels which are two-dimensional objects. There is absolutely no reason to modify the system of Abraham et al. to utilize three-dimensional CAD files, when the Abraham et al. system is solely devoted to the construction of two-dimensional articles. What would be the possible motivation for using three-dimensional CAD files to manufacture two-dimensional articles? Clearly there is none.

The Dependent Claims

In the previous response filed by Applicant, Applicant separately traversed the Examiner's rejection of several groups of the dependent claims and presented very substantive arguments in support thereof, which the Examiner has not responded to at all in the most recent Office Action. This includes the fact that the Examiner has not even acknowledged that the Protomold.com reference cited by the Examiner is not prior art to the present application in view of the DECLARATION UNDER RULE 131 previously filed by Applicant.

Applicant is repeating below the substance of those previous arguments and respectfully requests that the Examiner at least respond to the arguments

presented by Applicant so that Applicant can understand whatever continuing ground there may be for the Examiner's rejection.

Formula Based Pricing And The Tadao Reference

Many of Applicant's claims are directed to specific pricing formulas or features of specific pricing formulas that permit Applicant the ability in a commercially satisfactory way to automatically provide binding price quotations on three-dimensional objects of arbitrary shape. These particular formulas are very significant to the present invention and with respect the Examiner has not given them the consideration they deserve.

In the rejection beginning at the bottom of page 5 of the Office Action the Examiner has rejected claims 2-6, 33-37 and 53-58 under 35 U.S.C. §103 based upon Abraham et al. in view of AAPA and Tadao et al. Japanese Patent JP 09160945.

The Examiner has referred to paragraph [0020] of Tadao as disclosing the use of a formula to estimate cost.

Of course, the only one of the rejected claims which simply refers to the use of "a formula" generically is claim 2, which the Examiner seems to appreciate. The Examiner goes on to reject claims 3-6, 54-58 and 33-37 which deal with specific formulas based upon the Examiner's totally unsupported contention that it would be obvious to "utilize any formula to calculate the manufacturing cost because applicant has not disclosed that the applicant's formula provides an advantage."

Nothing could be further from the truth. Applicant has set forth in great detail the advantage, the particular purpose, and the stated problem which is solved by the specific formula of claim 3 and the other dependent claims.

Namely, the present invention and the particular formula set forth in claim 3, provide a system which is suitable for calculating "a firm price quotation" as is clearly required in claim 1, and provides a means for doing so in a way which the proprietor of the program can commit to commercially binding transactions on a profitable basis without resort to detailed analysis of the individual features of each part as has historically been required. See page 29, line 19 through page 30, line 2 of the application which states the following:

"The value of the pricing formula of the structure set forth in Equation 1 is that we have discovered that reasonable prices can be accurately determined in a reliably profitable manner by using a formula of the structure set forth, wherein the variables correspond to the volume of the parts being constructed and the vertical height dimension of the parts as a set when oriented in the most efficient fashion."

Not only does Tadao et al. not disclose the formula required in claims 3-6, 33-37, or 54-58, but further the use of formulas which is only generally described in Tadao is clearly simply for the purpose of estimating and is not suggested as being adequate for providing binding price quotations.

It will be appreciated by the Examiner that the provision of simple estimates, which may have value in a relative sense to a design process, is a far cry from a system which can generate binding price quotations of sufficient accuracy that the proprietor of the system can commit sight unseen to selling products in a profitable

manner based upon those binding price quotations. And it is particularly significant that Applicant's system can do this for parts "of arbitrary shape", and not just for common geometric shapes set forth in a menu dictated by the manufacturer.

It is difficult to conceive of a more significant advantage than that which has been explicitly disclosed by Applicant in the present application.

**Unique Formulas For Different Manufacturing Processes,
In View Of The Hazama Et Al. Reference**

In the rejection beginning in the middle of page 7 of the Office Action the Examiner has rejected claims 7-12, 14-15, and 38-42 under 35 U.S.C. §103 based upon Abraham et al. in view of AAPA and Tadao et al., and further in view of Hazama et al. U.S. Patent No. 6,539,399.

The Examiner basically takes the position that Hazama et al. allows a user to select from multiple manufacturing processes. The Examiner then leaps to the conclusion that none of the Applicant's specific processes are patentable, and the Examiner further compounds her error via the statement that "these differences are only found in the nonfunctional descriptive material and are not functionally involved in the steps recited." This simply is not true. Claim 7 adds the step of permitting the client to select one of the plurality of available manufacturing processes and then specifies that in step (e) of previously stated claim 1 wherein the firm price quotation is calculated the step "includes calculating the price quotation for the selected manufacturing process". Thus the functional step of price calculation must be based upon the selected manufacturing process. Claims 8-12

and 14-15 then are directed to specific manufacturing processes, and accordingly the step (e) of price calculation involved with each of those processes must involve calculating the price quotation “for the selected manufacturing process”. The formula must be specifically adapted to that process.

Applicant has very specifically taught specific formulas for each of the processes in question. For example with regard to claim 9 which focuses on the “stereolithography process” Applicant teaches in detail the specific formulas for use with that process as found at page 23 line 8 through page 31 line 3.

With regard to the “selected laser centering process” which is the focus of claim 10, Applicant has specifically taught the formulas for use with that process as found at page 31 line 5 through page 34 line 20.

With regard to the “fused deposition modeling process” which is the focus of claim 11, Applicant has specifically taught the formulas for use with that process as found at page 35 line 1 through page 36 line 6 of the application.

With regard to the use of “formative manufacturing processes” which are the focus of claim 12, Applicant has taught specific formulas for use therewith as found at page 36 line 8 through page 41 line 4 of the application.

With regard to the process of molding parts which is the focus of claim 14, Applicant has taught specific formulas for use with such processes as found at page 41 line 6 through page 42 line 11 of the application.

The Examiner’s suggestion that these features do not modify the functional steps involved in the claims is simply indefensible.

Furthermore, the Examiner's reliance on the cases *In re Gulack* and *In re Lowry* is completely misplaced. The case of *In re Gulack* deals strictly with the question of printed matter, and even there it recognizes that where the printed matter is functionally related to the article on which it is placed, the printed matter can be of patentable significance, as it is the claim as a whole that must be considered for patentability. More significantly, however, the *In re Lowry* case makes it very clear that the limitations on the ability of printed matter to lend patentability to a claim are totally irrelevant to claims directed to information processing by a computer, such as is the case with the present application. At 32 USPQ 2d 1034 the Court of Appeals for the Federal Circuit specifically states:

“The printed matter cases have no factual relevance where “the invention as defined by the claims requires that the information be processed not by the mind but by a machine, the computer.” *id.* (emphasis an original). Lowry's data structures, which according to Lowry greatly facilitate data management by data processing systems, are processed by a machine. Indeed they are not accessible other than through sophisticated software systems. The printed matter cases have no factual relevance here.” (emphasis to last sentence added)

Thus, the Examiner cannot ignore the requirement of the claims in question that the calculation of the price quotation be specifically tailored for a selected manufacturing process, such as the additive manufacturing process of claim 8, the stereolithography process of claim 9, the selective laser centering process of claim 10, the fused deposition modeling process of claim 11, the formative manufacturing process of claim 12, or the molding of parts from soft rubber tooling created using a

pattern manufactured by an additive manufacturing process as required by claim 14.

Specific Manufacturing Criteria And The Protomold.com Reference

The Examiner's rejections at paragraphs 6 and 7 of the Office Action all rely in part upon the Protomold.com reference. The Protomold.com reference as constructed by the Examiner is not prior art to the present application. As shown in the DECLARATION UNDER RULE 131 previously submitted in this application the present invention was reduced to practice at least by January 3, 2000 when Applicant's website including all the claimed features was launched.

Much of the Protomold.com reference cited by the Examiner was generated after January 3, 2000, including at least pages 6-14 and page 17 thereof, all of which according to the marginal notations on the bottom of each page were recorded on Archive.org after January 3, 2000.

Since much of the Examiner's discussion of Protomold.com does not indicate what portions of the document the Examiner is relying on, it is respectfully submitted that the Protomold.com reference as it is presently constituted does not constitute prior art to the present application, and the reference should be withdrawn.

For this same reason the Examiner's rejection of claims 22 and 60 based upon Abraham et al. in view of Protomold.com and further in view of Partsnow.com should be withdrawn.

Buildsets And The Takeshi Reference

In the rejection at paragraph 8 of the Office Action beginning in the middle of page 12 of the Office Action the Examiner rejects claims 25-26, 28, 47-51 and 62-64 under 35 U.S.C. §103 based upon Abraham et al. in view of AAPA and Takeshi et al. Japanese Patent JP 09114873.

The Examiner's description of Takeshi refers to no specific discussion therein, but merely refers to the English language abstract and the figures and makes the unsubstantiated conclusion that Takeshi et al. discloses "for a volume calculation apparatus for 3D components defined using CAD, that the apparatus includes a buildset grouping program for grouping a plurality of parts making up a buildset into a plurality of subsets of parts, each subset being of a size that will fit upon an available platform area of a selected machine".

The Examiner's reliance on Takeshi is completely misplaced. The Takeshi reference merely provides a method for calculating the volume of a component defined in a CAD file. That volume calculation is apparently made by breaking the three-dimensional shape up into individual pixels which are then projected onto a two-dimensional plane and then added up to determine the volume of the component. But that has absolutely nothing to do with buildsets of multiple components or with determining platform areas required by each part of the buildset and total platform area required by the buildset. The platform areas required by each part and by the total buildset are not directly related to the volume of those parts but instead are related to the footprint of those parts. With respect, the Takeshi reference is simply irrelevant to the present invention.

Claims 27 And 32 Regarding STL Files

In paragraph 9 of the Office Action at the top of page 15 the Examiner has rejected claims 27 and 32 under 35 U.S.C. 103 based upon Abraham et al. in view of AAPA and further in view of Partsnow.com. Those claims are submitted to be allowable for the same reasons as independent claims 1 and 31 from which they depend, and for the further reason that the Partsnow.com reference does not supply any of the deficiencies previously noted with regard to those parent claims.

Conclusion

For all of the reasons set forth above it is respectfully submitted that claims 1-73 as amended are all in condition for allowance.

Respectfully submitted,

/Lucian Wayne Beavers, 28,183/
Lucian Wayne Beavers
Registration No. 28,183
WADDEY & PATTERSON
A Professional Corporation
Customer No. 23456

ATTORNEY FOR APPLICANT

This attorney is located at our Nashville, Tennessee office and can be contacted directly at:

Lucian Wayne Beavers
Waddey & Patterson
1600 Division Street
Roundabout Plaza
Nashville, TN 37203
(615) 242-2400

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I hereby certify that this RESPONSE TO FINAL OFFICE ACTION, REQUEST FOR CONTINUED EXAMINATION, AND REQUEST FOR INTERVIEW for U.S. Patent Application No. 09/736,555 filed December 13, 2000 is being deposited with the United States Postal Service by electronic filing addressed to:

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/Lucian Wayne Beavers, 28,183/

Lucian Wayne Beavers